Listing of Claims

1. (Previously Presented) A semiconductor laser, comprising:

a monolithic semiconductor laser cavity having at least one segment and at least one output;

at least one etched gap extending through said at least one segment; and

at least one distributed Bragg reflector (DBR) at said at least one output.

2. (Original) The laser of claim 1, wherein the total length of said laser cavity is between about 10 μm and about 10,000 μm.

3. (Currently Amended) The laser of claim 1, wherein said at least one laser cavity segment includes an active region and said etched gap comprises spaced-apart etched facets extending through said active region, and wherein said gap has a length of between about 0.0001 μm and about 10 μm.

4. (Original) The laser of claim 1, further including at least one photonic device connected to said at least one output of said laser cavity.

5. (Previously Presented) The laser of claim 1, wherein the laser is a ring laser having multiple segments joined end-to-end.

6. (Previously Presented) The laser of claim 1, wherein the laser cavity includes two segments joined at an etched output facet to form a V-shaped laser, said at least one etched gap in at least one segment providing improved unidirectionality.

7. (Previously Presented) A semiconductor laser, comprising:

a monolithic semiconductor laser cavity having at least one segment and at least one output;

at least one etched gap extending through said at least one segment of the laser,

at least one photonic device coupled to said at least one output of said laser, and

at least an etched facet at or near the Brewster angle at one end of said photonic device.

8. (Original) The laser of claim 7, wherein the total length of said laser cavity is between about 10 μm and about 10,000 μm.

9. (Original) The laser of claim 7, wherein said at least one etched gap has a length of between about 0.001 μm and about 10 μm.

10. (Original) A semiconductor photonic device, comprising:

a cavity having at least one segment; and

at least an etched facet at or near the Brewster angle at one end of said at least one segment.

11. (Original) The photonic device of claim 10, wherein said cavity includes an entrance facet and an exit facet.

12. (Currently Amended) The photonic device of claim [[10]] 11, wherein said entrance facet is directly coupled to another photonic device.

13. (Original) The photonic device of claim 10, wherein said photonic device is a V-shaped structure and wherein said at least one segment includes a first and a second leg.

14. (Original) The photonic device of claim 13, wherein said etched facet at or near the Brewster angle is at an end of said first leg of said V-shaped structure.

15. (Original) The photonic device of claim 14, wherein said first and second legs are joined at corresponding ends to form said V-shaped structure, and wherein an exit facet is positioned at the joint of the said first and second legs.

16. (Original) The photonic device of claim 15, further including an entrance facet at a free end of said second leg of said V-shaped structure.

17. (Previously presented) The laser of claim 5, wherein said at least one segment incorporates multiple etched gaps, each gap extending through said at least one segment.

18. (Previously presented) The laser of claim 17, wherein each of said gaps comprises a pair of spaced-apart etched facets.

19. (Previously presented) The laser of claim 1, wherein said at least one segment incorporates multiple etched gaps, each gap extending through said at least one segment.

20. (Previously presented) The laser of claim 19, wherein said multiple etched gaps comprises first and second gaps spaced apart along said at least one segment and separated by a length of said segment.

21. (Previously presented) The laser of claim 20, wherein each said gap comprises a pair of spaced-apart etched facets, each pair of facets forming a gap having a length of between about 0.001 μm and about 10.0 μm extending completely through the laser cavity.

22. (Previously presented) The laser of claim 21, wherein each facet is perpendicular to the length of said segment.

23. (Previously presented) The laser of claim 21, wherein each said facet is angled with respect to the length of said segment.

24. (Previously presented) The laser of claim 23, wherein said length of said segment between said first and second gaps is offset from adjoining segments to compensate for the refraction of light at the interfaces of the laser segment and said gaps.

25. (Previously Presented) A semiconductor device, comprising:

a monolithic solid state waveguide cavity having an etched entrance facet and an etched exit facet;

an etched gap extending through said solid state waveguide cavity between said entrance and exit facets, said etched gap comprising a pair of parallel etched facets spaced apart by a length of between about 0.001 μm and 10 μm.

26. (Previously presented) The device of claim 25, further including multiple etched gaps spaced along said waveguide cavity.

27. (Previously presented) The device of claim 26, wherein said gaps are angled, and further including an offset segment of said waveguide cavity between adjacent gaps.

28. (Previously presented) The device of claim 26, wherein said solid state waveguide cavity is a ring laser.

29. (Previously presented) The device of claim 28, wherein said exit facet is coupled to an input facet of a photonic device.

30. (Previously presented) The device of claim 29, wherein said photonic device is a V-shaped waveguide structure having an etched facet at or near the Brewster angle at a distal end.

31. (Previously presented) The laser of claim 1, wherein the laser cavity includes multiple segments joined end-to-end to form a ring cavity, at least two of said segments being joined at an etched facet to provide said output, wherein said at least one etched gap extends through one of said segments.

32. (Previously presented) The laser of claim 31, wherein said DBR is located externally of said ring laser cavity and adjacent said output etched facet.

33. (Previously presented) The laser of claim 32, wherein the laser cavity includes three segments joined end-to-end to form a triangular ring laser, and includes at least one etched gap in at least one of said segments to enhance unidirectionality in said laser .

34. (Previously presented) The laser of claim 31, further including a photonic device coupled to said output, said photonic device including a facet at the Brewster angle to minimize back-reflection into said laser cavity.

35. (Previously presented) The laser of claim 31, including at least one etched gap extending through each of at least two of said segments.

36. (Previously presented) The laser of claim 31, wherein laser light propagates along an optical axis of said ring cavity, and wherein said at least one etched gap includes etched facets spaced apart along said optical axis.

37. (Previously presented) The laser of claim 36, wherein said etched facets are perpendicular to said optical axis.

38. (Previously presented) The laser of claim 36, wherein said etched facets are parallel to each other and are angled with respect to said optical axis.

39. (Previously presented) The laser of claim 36, further including at least first and second etched gaps spaced apart along said optical axis to define an intermediate segment between the gaps, and each of said gaps including a pair of spaced, parallel facets.

40. (Previously presented) The laser of claim 39, wherein said intermediate segment is offset from said optical axis, and wherein the facets of each of said gaps are angled with respect to said optical axis to compensate for the refraction of light at said facets.

41. (Previously presented) The laser of claim 40, wherein said gaps are angled in opposite directions with respect to said optical axis.

42. (New) A semiconductor laser, comprising:

a monolithic solid state waveguide cavity having multiple segments joined along a longitudinal axis, an active region for generating light in said cavity, and an output facet for emitting generated light;

at lease one air gap extending through one of said segments to enhance unidirectionality in the waveguide, said air gap being defined by first and second parallel etched facets at an angle to said axis and spaced apart by between about 0.001 μm and about 10 μm.

43. (New) The semiconductor laser of claim 42, further including a photonic device having a near end and a distal end and coupled at its near end to said output facet, said photonic device incorporating a facet at the Brewster angle at its distal end to minimize back-reflection of said light.

44. (New) The semiconductor laser of claim 42, wherein said multiple segments are joined to form a ring laser or a V-shaped laser, with first and second segments being joined at said exit facet.

45. (New) The semiconductor laser of claim 44, further including multiple spaced-apart air gaps in at least one of said segments, each air gap being defined by parallel etched facets at an angle to said axis and spaced apart by between about 0.001 μm and about 10 μm.

46. (New) The semiconductor laser of claim 45, wherein said angle is substantially 90°.

47. (New) The semiconductor laser of claim 45, wherein first and second spaced-apart air gaps define an intermediate waveguide segment between the gaps, said intermediate segment being offset to compensate for refraction at the etched facets of the first and second air gaps.